FAX (850) 224 8410
8 PAGES

Date: 11/29/04

To: Stuart Walker/U.S. EPA
Brad Jackson/U. S. EPA

From: George Stephens/ANL

Subject: Guidance from EPA Concerning Polk County Properties

Stuart and Brad,

Attached is a copy of a letter from Richard Guimond of EPA to Don Guthrie of the Polk County Health Department that provides some guidance on interpretation of external gamma radiation measurements and radon flux data for a specific set of data associated with the Christina area. This letter was included in the Polk County Health Department file labeled "Christina Area", and is the only specific letter I could find from EPA. I've also attached a copy of a letter from the Polk County Health Department that references "Interim Recommendations for Gamma Exposure Levels at New Structured Sites on Florida Phosphate Lands" provided by EPA in 1976. There may be other guidance the State is referring to but this is all I could find so far.

I hope this is of some use in your meetings. (Please note that the values of radon flux as reported in the Guimond letter are actually in error by a factor of 10. There are some handwritten notes that show that the results should be a factor of 10 lower than reported).

Please let me know if I can provide anything else for your meetings.

George Stephens
Argonne National Laboratory
(865) 241-1520

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 25, 1977

Donald R. Guthrie, P.E.
Polk County Health Department
Department of Health and Rehabilitative Services
P.O. Box 1480
229 Avenue D, N.W.
Winter Haven, Florida 33880

Dear Mr. Guthrie:

We have reviewed the data you provided us in your letter of August 18 regarding the external gamma and radon flux levels on Mr. Stephens' property.

From the data you provided, the external gamma radiation ranges from about 8 to 40 μR/hr and the radon flux at the soil surface ranges from 440 aCi/cm^2-sec to 31,700 aCi/cm^2-sec. If we can assume that each measurement represents roughly the same area then the average external gamma radiation level and radon flux is 26 μR/hr and 5700 aCi/cm^2-sec, respectively. Of the numerous locations throughout Polk County where we have obtained data to date, this parcel has some of the highest external gamma and radon flux levels that we have found.

Enclosed is a figure which plots external exposure rate, and soil radium-226 concentration versus indoor radon daughter level for various ventilation rates within a structure. This figure is based upon theoretical caluclations which assume an infinite depth (greater than 10 feet) of soil which contains radium-226 in homogeneous concentrations. Further, it assumes that all of the radon generated in the soil which diffuses to the surface enters the structure where the only significant removal mechanism is ventilation. No reduction factor is considered for transport through the foundation. From the figure, an external exposure rate of 26 μR/hr would correspond to a soil radium-226 concentration of about 11 pCi/g. At a ventilation rate of one air change per hour, the indoor radon daughter level is

estimated to be about 0.13 WL. Our field data collected at existing structures indicates that at external gamma levels of about 26 μR/hr, the indoor radon daughter levels were between .018 and .072 WL. The average radon flux measurements around those structures ranged from 100 and 1000 aCi/cm^2-sec, considerably lower than most of the measurements on the proposed site.

As a result of these considerations it is very likely that any habitable structure constructed on the proposed site would exhibit elevated indoor radon daughter levels unless highly effective control technology is utilized in the construction of the structures. Further, even with control technology it is possible that the indoor radon daughter levels could not be reduced to near background levels (.001-.005 WL).

If Mr. Stephens would like to proceed with the development of the proposed site, the Environmental Protection Agency would be pleased to assist you and him in the selection of candidate control technologies, performing pre- and post-installation assessments and determining their effectiveness.

We are presently planning a field trip to Florida during September. It might be appropriate to discuss this matter more fully at that time should you and Mr. Stephens so desire.

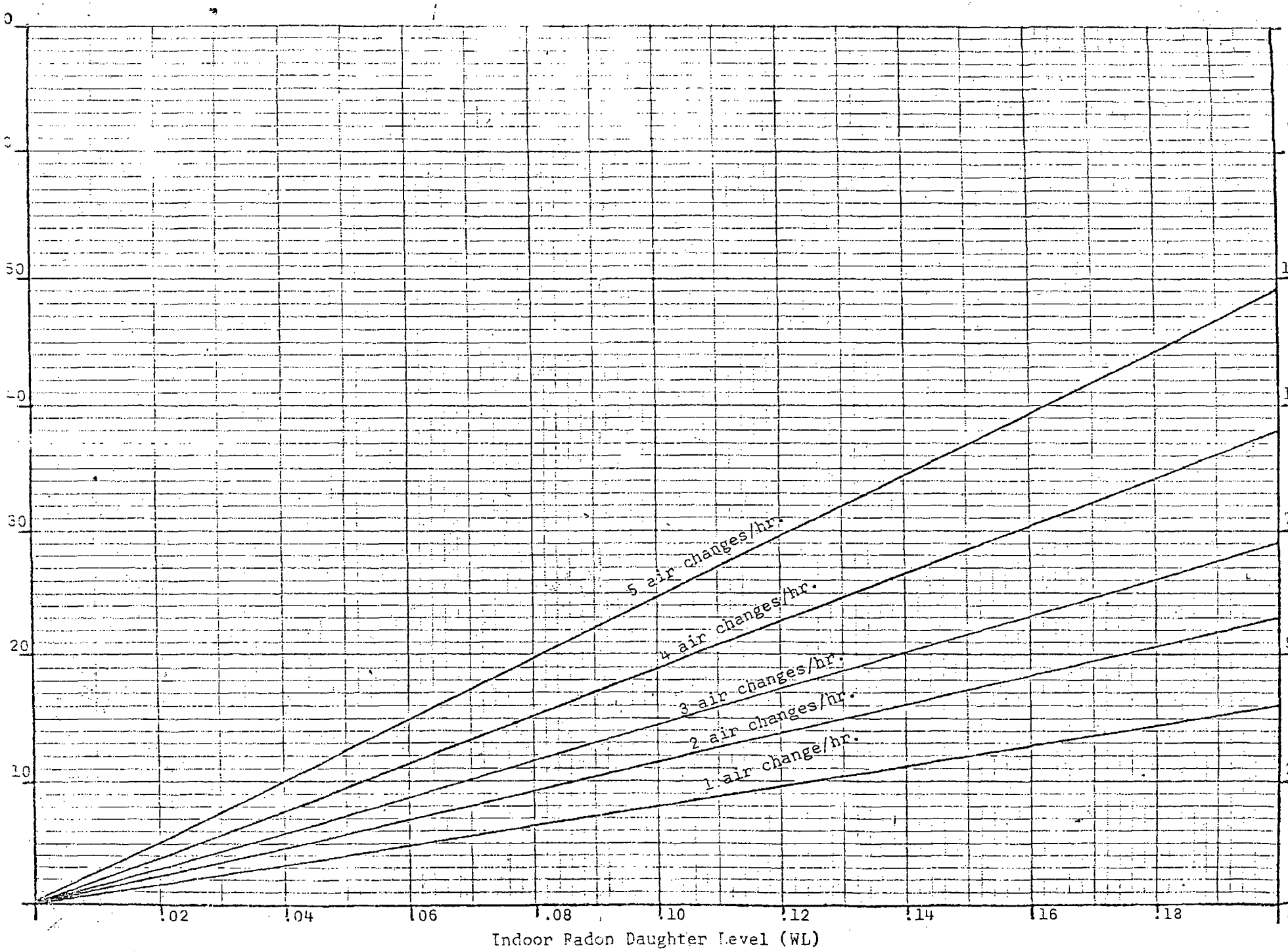
Sincerely yours,

Richard J. Guimond

Richard J. Guimond
Criteria & Standards Division (AW-460)
Office of Radiation Programs

Enclosure

cc: Mr. Charles R. Porter, EERF
Mr. Ulray Clark, Florida
Mr. Richard H. Payne, Region IV
Mr. Don Stephens, Florida



[redacted]

DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES . . . . . STATE OF FLORIDA
Reubin O'D Askew, Governor

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POLK COUNTY HEALTH DEPARTMENT

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243 E. LAKE AVENUE
AUBURNDALE, FLORIDA 33823

August 18, 1977

Rad Health/ Land Survey
Don Stevens Property

Richard J. Guimond AW 460
Office of Radiation Programs
Environmental Protection Agency
Room 631 Waterside Mall East
401 M. Street, S.W.
Washington, D. C. 20460

Dear Mr. Guimond:

Enclosed you will find the data on Mr. Stephens' property that we discussed by telephone. As you will note the Radon Flux Levels are considerably above these found in the adjacent areas. In talking with Mr. Stephens, he indicated that he desired your interpretation of the data, although he would most likely proceed with the development of the property. We agreed to cooperate in any way possible, as far as testing and suggesting control technology to minimize the problem, in return he indicated he would cooperate with this agency in this respect.

As previously discussed if you feel soil samples to a depth of six feet would be of any benefit in this aim, we will gladly take and ship any samples requested to the Eastern Laboratory in Montgomery. Should you wish to communicate directly with Mr. Stephens, his address and telephone number is: Don Stephens, Sun State Homes, Inc., 3608 South Florida Avenue, Lakeland, Florida 33803; Phone: 813/646-5881.

Please do not hesitate to contact me, if I may be of any further service in this matter.

Sincerely,

Donald R. Guthrie, P.E.
Sanitary Engineer

DRG:mnk
cc: Mr. Stephens
cc: Sam Windham
cc: Radiological & Occupational Health Office

Flux Canister Number	Gamma Reading UR/hr*	Rn Flux pCi/m^2/sec.	Flux Canister Number	Gamma Reading UR/hr*	Rn Flux pCi/m^2/sec.
30	38	3.9	174	15	2.2
157	40	8.3	183	12	3.3
170	40	2.8	146	30	7.0
13	29	9.2	192	34	6.2
223	32	0.44	181	29	6.3
48	35	31.7	218	30	2.7
156	35	6.5	148	31	4.9
165	26	3.6	161	23	5.5
176	22	8.7	70	35	1.7
143	16	0.58	199	18	4.0
10	23	2.5	220	9	0.70
74	33	2.9	222	8	1.3
17	26	2.2	149	24	4.7
168	27	7.9	2	27	4.0
164	28	9.5	211	40	14.8
162	34	3.4	44	35	5.7
20	32	3.7	169	37	6.1
221	40	7.4			
163	20	5.2			
29	30	2.5			
139	12	19.2			
196	14	12.5			
224	32	3.1			
188	16	0.48			
214	24	1.3			

DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES . . . . . STATE OF FLORIDA
Bruce Otis Askew, Governor

POLK COUNTY HEALTH DEPARTMENT

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243 E. LAKE AVENUE
AUBURNDALE, FLORIDA 33823

April 30, 1976

Barrett, Haentjens & Company
Hazleton, Pennsylvania 18201

Dear Sir:

Enclosed you will find a gamma map of BARRETT, HAENTJEN & COMPANY of FLORIDA. The map is comprised of 12 internal gamma radiation readings and 14 external gamma radiation readings. The following is the interim guidelines set forth by the United States Environmental Protection Agency, they have been printed in the Federal Register.

INTERIM RECOMMENDATIONS FOR GAMMA EXPOSURE LEVELS
AT NEW STRUCTURED SITES ON FLORIDA PHOSPHATE LANDS

EXTERNAL GAMMA RADIATION LEVEL	RECOMMENDATIONS
Equal or greater than 10 uR/hr	Construction should be delayed pending additional study or acceptable control technology should be instituted to preclude indoor radon daughter problems.
Less than 10 uR/hr	Construction may be initiated.

As compared to the guideline, the readings taken at your plant do not meet the 10 uR/hr radiation level. But I would like to point out that the interim recommendations purpose is to limit radon daughter exposures in structures constructed on Florida phosphate lands.

Radon 222 is a radioactive daughter product of the uranium decay series. It in turn decays into other radioactive elements. The problem arises from the fact that Radon 222 is a gas that decays fairly rapidly and can be inhaled into the lungs. There it decays into radioactive solids, which, if present in large enough quantities can become cancer causative agents.

Although your plant has elevated gamma readings it is doubtful that you would have a large buildup of Radon 222 in your plant due to its construction.

I am making reference to the large entrances at both ends of your plant. These large openings should provide more than adequate ventilation for a structure of this size. We are in the process of obtaining equipment which will measure the amount of Radon present in a structure. This equipment should arrive later this summer. At that time we would be glad to further our investigation of your plant for you.

I would also like to point out that the recommendations set forth by the EPA are interim and a final report and regulations should be forth coming by the end of 1976.

Sincerely

Harlan Keaton
Industrial Hygienist II

HK:bb